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Dear Salva,

Thank you very much for encouraging Sarkar to come to see me. His experimental work is extremely interesting and it is obvious that he is now leading the field. I have had some relationship through WHO in trying to encourage work along these lines and I will certainly see to it that he gets every boost possible.

As I discussed with him, however, there are practical problems, even assuming that the basic scientific and technological issues can be worked out, that will probably impede the widespread use of immunological approaches. These have to do mainly with the unlikelihood that immunizations with a limited number of inoculations can achieve anything like the reliability that is available from other methods. From the standpoint of personal, voluntary access to population control any ambiguity about one's fertility is obviously a serious impediment. Also at a more scientific level there are likely to be problems in relating systemic immunity to the level of antibody that appears in the secretions of the reproductive tract where they must be in order to be effective.

Nonetheless, this is such an important area touching on so many aspects of medicine and human biology that I have no doubt that it should be vigorously pursued.

I wonder though whether you have thought through your own advocacy of research in this area. I bring this up as a test of what you mean by your mandate of the ethical responsibility of the scientist. It seems to me that immunological means of sterilization pose a much more serious potential threat of the imposition of federal control over reproductive behavior than any of the areas of genetic control that have been so widely discussed. In fact, even Sarkar is on the verge of advocating that this be the method to be pursued for a more or less involuntary enrollment of people in the developing countries to nationally imposed policies about population control. So there may really be some tangible reality, and before too many years have gone by, to this kind of possibility. Furthermore, for these purposes it will be less important if the sterilizing procedure is only 95% effective. In addition, we have the historical parallel -- if you read the Nuremberg Trials you will see the rather silly attempt that were made at one time, in response to a suggestion by a fool Podkorny, to develop a chemical sterilant. Will you still encourage Sarkar to continue with his experiments knowing of these possibilities of political perversion of his findings? For my part I would find it difficult to draw a line that

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would justify raising great alarm about "genetic engineering" and was acquiescent about the much more nearly realizable hazards of "reproductive engineering" but I am not trying to press my views on you but to find out how you have learned to deal with these distinctions.

Sincerely yours,

Joshua Lederberg
Professor of Genetics

JL/rr